

sterlite copper

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 /sterlite copper - Vedanta Limited

Homer, the legendary Greek author, named me Chalkos. At home in India, they called me Tamara.
The Romans renamed me Aes Cyprium. My current name is an anglicized version of this Latin phrase.

HI, I AM COPPER



MY JOURNEY

The Genesis of Copper

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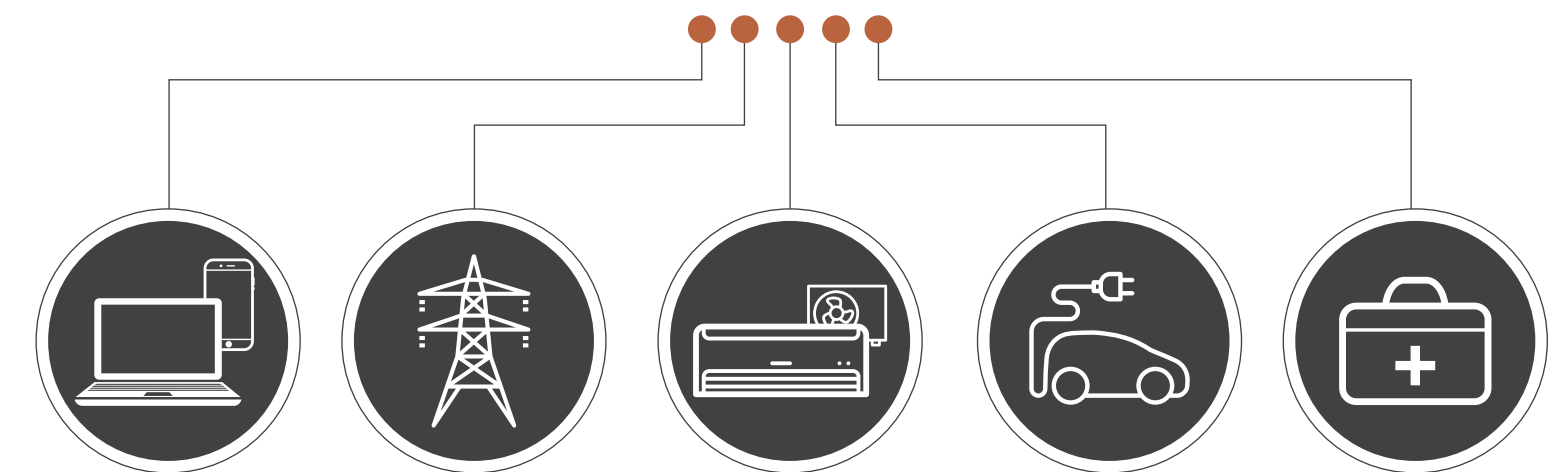


It was around 9000 BC that my tryst with man began. In Egypt. In a river. A stray sparkle from my shiny appearance caught his attention and kindled the curiosity hardwired into his system. And true to the spirit of inquiry and new thinking that has distinguished the human mind through history, it was enough to unfold a series of innovations.

As time passed, man began to understand my properties, my malleability and harnessed my utility to create many milestone applications. The effort remained unabated till the Space Age. From toasting bread to whetting his appetite for exploring the unknown realms of outer space, I soon became an integral part of mankind's evolution.

“Today, the world is getting ready for another Copper Age spurred by an unprecedented growth in advanced industrial, energy and consumer applications. Electric cars and spacecrafts will fuel a huge increase in copper consumption. In fact, a single car can have up to six kilometers of copper wiring, according to the International Copper Association. That’s really long, you will agree!”

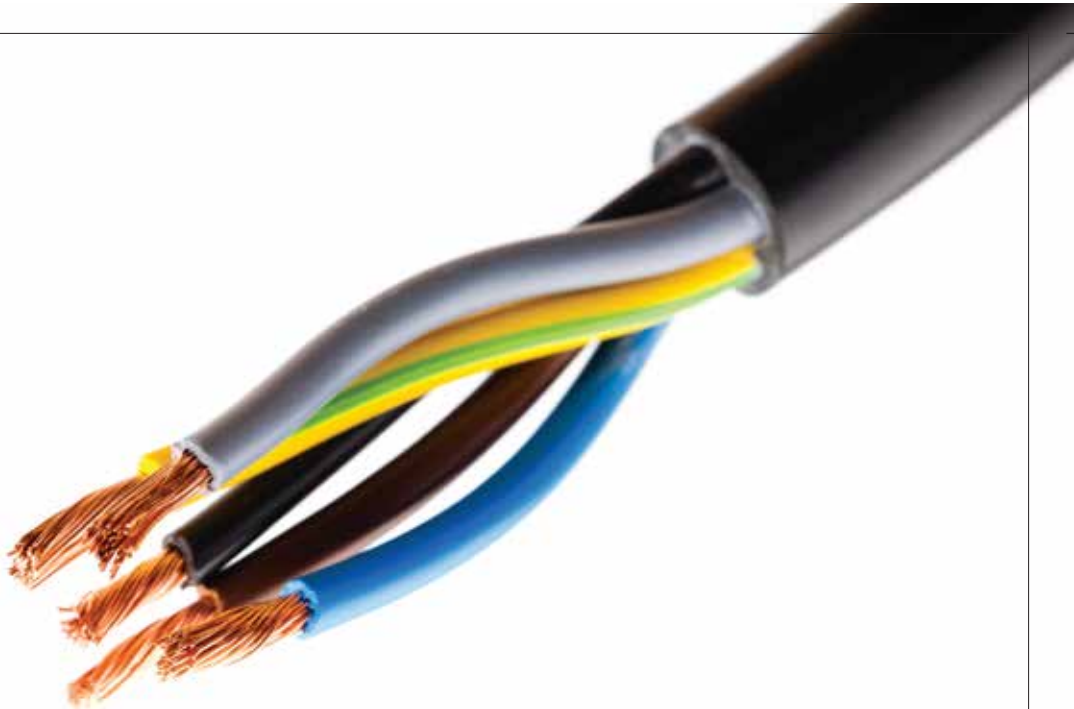
LOOK AROUND, I AM EVERYWHERE





THE WORLD IS MY STAGE

They say copper usage within a particular economy represents its health and quality of life. Interestingly, developed economies have concentrated more on my antimicrobial benefits and used me in healthcare, food packaging, aquaculture and air conditioning. In developing economies, inclusive economic growth, affordable housing, industrialization and infrastructure development are spearheading the usage of copper. In India specifically, by-products of copper smelting such as Sulphuric and Phosphoric acid are fuelling the growth of agriculture and numerous other industries, including automobiles, consumer durables and electricals. The 21st century however is also likely to be dominated by a milieu in which humans explore the depths of space and extraterrestrial geographies for signs of life, to colonize and to understand more about the universe. I will be the mainstay of all these endeavours.



Globalization has made copper more valuable



MY SMELTERS ACROSS THE WORLD

Today in developed countries, my copper plants are situated close to human habitat and functioning for years, providing jobs and development to the surrounding region.

Ample proof that industries and communities can peacefully coexist, provided the right mechanisms are in place.





STATUE OF LIBERTY, USA

Through one hundred years of biting sea winds, driving rains and beating sun, the copper skin of the Statue of Liberty has not only grown more beautiful but has also remained virtually intact.

MY STERLITE DIARY

1996. Silvassa and Thoothukudi. That's where it all began, serving an array of industries, including defence, automobiles, consumer durables, electricals and construction. Today, Sterlite has the distinction of meeting 36% of the national demand and contributes significantly to the global demand for copper.

1 Lakh Tonne
Per Annum
(LTPA) Smelter
and Phosphoric
Acid plant with
2,20,000 Metric
Tonnes Per
Annum (MPTA)
capacity
commissioned

1996

Production
capacity
enhanced to
3 LTPA

2005

Production
capacity
enhanced to
4 LTPA

2007

160 MW
Thermal Power
Plant
commissioned
(60 MW for
Sterlite, surplus
supplied to
Tamil Nadu state
power grid)

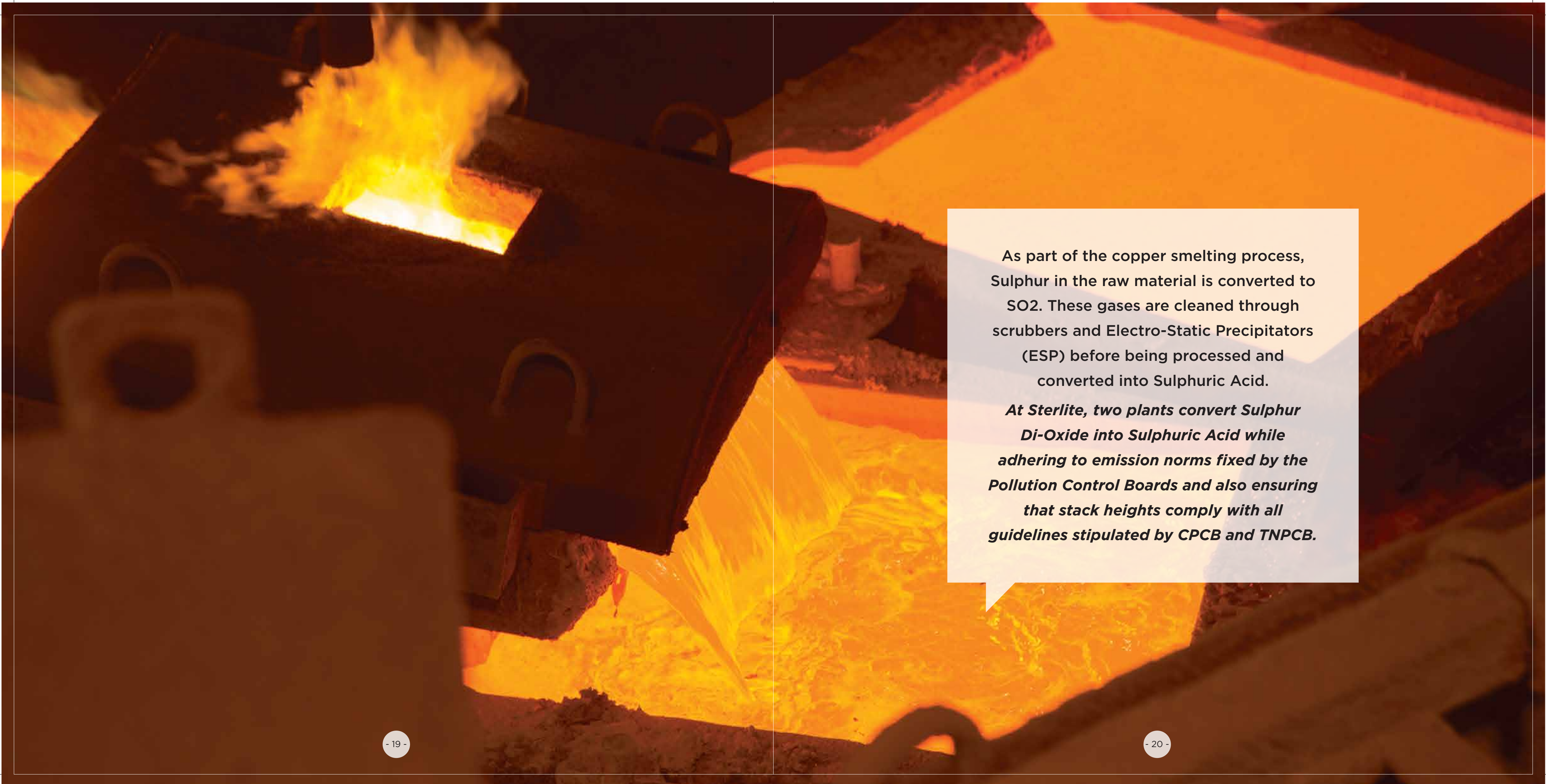
2013



The Silvassa Operations produces continuous cast copper rod (CCR). A part of the copper anodes manufactured in Thoothukudi is sent to Silvassa for further processing. The copper cathodes are processed

into copper rods in the CCR unit. These copper rods go on to serve as raw materials for a host of industries, such as wires, cables, transformers and household electrical appliances among others.

The Thoothukudi plant has been functioning with all necessary regulatory clearances right from inception. All processes conform to international standards such as the International Finance Corporation's (IFC) Performance Standards, and are applied across the entire lifecycle of all operations.

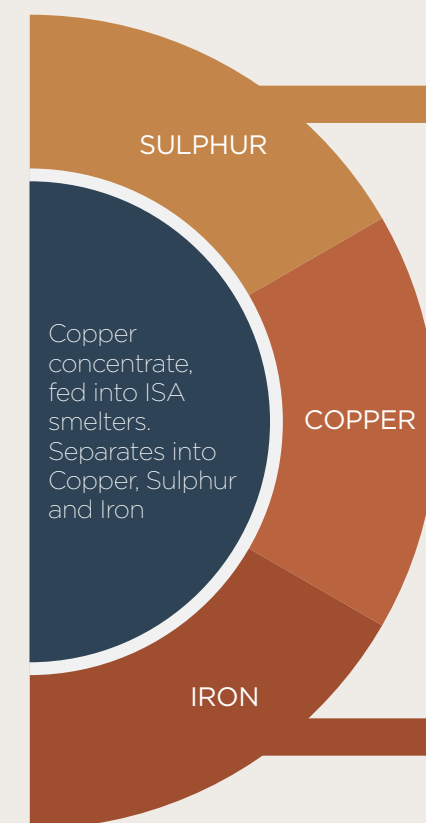


As part of the copper smelting process, Sulphur in the raw material is converted to SO₂. These gases are cleaned through scrubbers and Electro-Static Precipitators (ESP) before being processed and converted into Sulphuric Acid.

At Sterlite, two plants convert Sulphur Di-Oxide into Sulphuric Acid while adhering to emission norms fixed by the Pollution Control Boards and also ensuring that stack heights comply with all guidelines stipulated by CPCB and TNPCB.



Copper concentrate, the key raw material imported into India.



Sulphur gets converted to SO₂ gas

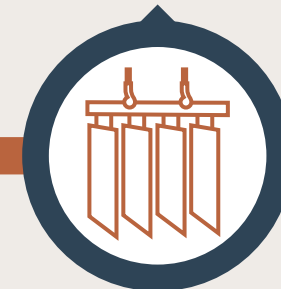


Copper metal is subjected to 2 stages of purification and purified to 99.5% Copper anodes



99.5% of the SO₂ gas is converted to Sulphuric acid

Copper anodes are further purified to 99.99% pure copper cathodes and wire rods



The remaining SO₂ gas is cleaned in scrubbers before being emitted



Sulphuric Acid used to make fertilizers & detergents is a boon for farmers and homes



Copper rods and sheets serve innumerable industries



Alternate for sand mining, keeps earth greener



The slag serves as replacement for river sand



Used in building construction and road laying



The iron silicate is granulated to form copper slag

Corporate Response-ability

The desire to be different, the motivation to do something new is what makes Sterlite Copper's smelting process unique. In a rare effort, Sterlite ensures that every by-product is smartly utilized thus promoting sustainable development in its true sense.

MY MILESTONES OF PRIDE AT STERLITE COPPER

A will finds a way...

When you decide to excel in what you set out to do, there's no stopping you. The focus at Sterlite Copper was no different. Today the company's operations are benchmarked against global best practices, with certifications in Quality, Environment, Occupational Health & Safety, Energy, Information Security, Lab Accreditation and Asset Optimization and the technologies used are sourced from best-in-class providers across countries such as Australia, the US, Finland, Canada, France and Germany. To my delight, Sterlite has invested over INR 500 crores in environmental safeguards such as Gas Scrubbers, Effluent Treatment Plants and Reverse Osmosis (RO) plants.

Zero Liquid Discharge Unit

Sterlite Copper is equipped with Effluent Treatment Plants (ETP) and Reverse Osmosis Plants (RO) to treat effluents and recycle waste water. It has been a Zero Liquid Discharge Unit right from inception which is a unique feature of Sterlite.

Water Consumption Management

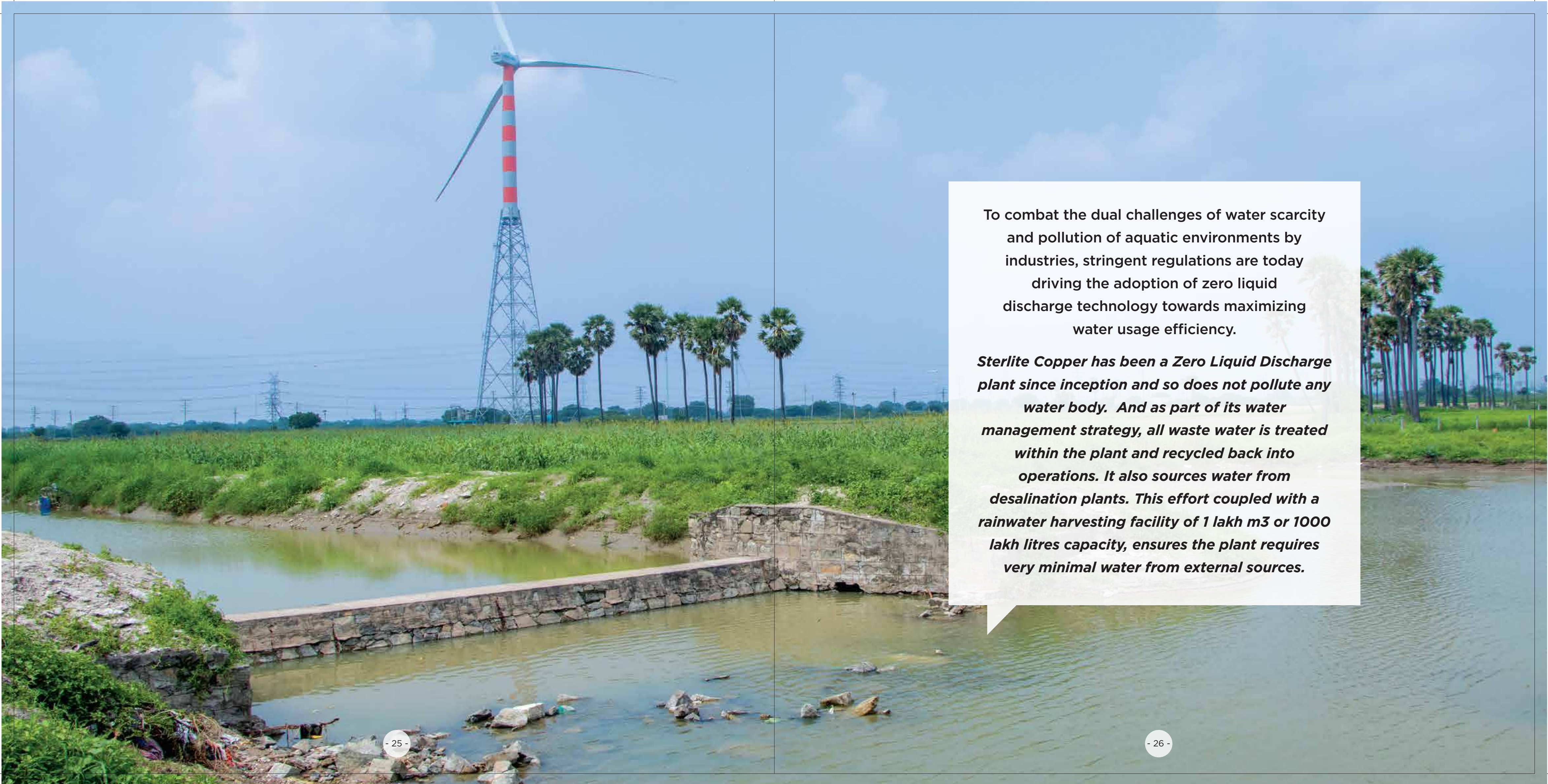
As part of its efforts to minimize water consumption, Sterlite has engaged various external vendors to procure desalinated water, reducing any dependence on freshwater sources. Sterlite Copper has also upgraded from water cooled technologies to air-cooled technologies for operations. Further, the company has installed rainwater storage tanks with a capacity of 1 lakh m3, to utilize in its operations.

Value from waste

Sterlite extracts more value from its by-products to achieve higher waste reduction. With advanced technology, Sterlite extracts Selenium, Nickel and Copper Telluride from the waste produced.

Solid Waste to Sustainable applications

Large volume wastes like Gypsum, Slag, Fly Ash and Bottom ash (from the power plant) find sustainable use in laying roads, cement production and concrete manufacturing.



To combat the dual challenges of water scarcity and pollution of aquatic environments by industries, stringent regulations are today driving the adoption of zero liquid discharge technology towards maximizing water usage efficiency.

Sterlite Copper has been a Zero Liquid Discharge plant since inception and so does not pollute any water body. And as part of its water management strategy, all waste water is treated within the plant and recycled back into operations. It also sources water from desalination plants. This effort coupled with a rainwater harvesting facility of 1 lakh m³ or 1000 lakh litres capacity, ensures the plant requires very minimal water from external sources.



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Disclaimer:
Creative representation only.

STATUE OF BUDDHA, BHAGALPUR

7 feet 6 inches high and weighing nearly 1 ton, a Buddha statue was discovered at Sultanganj in Bhagalpur in the ruins of an old Buddhist monastery. The remarkable copper colossus is testimony to the metallurgical skills of the ancient Hindus of the fifth century AD.

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THERE IS NO PLANET B

That's a truth man has to live with. The environment is no one's property to destroy; it's everyone's responsibility to protect. Man needs to promote development that promotes the environment and not destroy it. Let's now have a look at Sterlite Copper's benchmarking initiatives towards keeping the environment safe. This section might seem a little too technical, but hang in there, it's worth the read to understand everything the company does to ensure a safe environment for its partner community!



DEDICATED GAS CLEANING PLANT (GCP)

The primary off-gases from the smelter and convertor operations are collected and sent to the Gas Cleaning Plant. The fine dust containing metals in the gas stream is scrubbed off in the Gas Cleaning Plant through an intensive gas-liquid contact process thus producing cleaned gases. These gases are passed through conversion beds for the production of sulphuric acid.

Cost of project: INR 1100 Lacs

Benefits: Helps eliminate particulates from the sulphur dioxide gas to produce better quality, crystal clear sulphuric acid.



SECONDARY GASES SCRUBBING SYSTEM

The relatively low concentration of secondary sulphur dioxide gases from the smelter and convertor furnace operations are collected through duct arrangement. The collected off-gases are scrubbed off with lime to bring down the concentration before venting through stacks, thus meeting the emission norms set by the Ministry of Environment & Forests.

Cost of project: INR 360 Lacs

Benefits: Significantly reduced stack emissions.



SCRUBBERS AT ACID PLANTS

Phosphoric Acid Plant – 5 stage scrubbing

A five-stage scrubbing system replaced the three-stage scrubbing system to control fluorine emission thereby enhancing control of emissions. Due to multiple stages of scrubbing, Hydro Fluoride emissions are converted into hydrofluorosilicic acid ensuring enhanced resource recovery and reduced emissions.

Cost of project: INR 200 Lacs

Benefits: Fluorine emissions reduced to below statutory levels, Enhanced resource conservation.



Sulphuric Acid Plant – Tail Gas Scrubber

To bring down the sulphur dioxide emissions from the sulphuric acid plant to significantly lower levels, an Alkali Tail Gas Scrubber has been installed at both the Sulphuric acid plants. Caustic lye is used as a medium for scrubbing the gases in place of the conventional lime scrubbing.

Cost of project: INR 800 Lacs.

Benefits: Achieved emission level of less than 1kg / Ton of Sulphuric acid produced.



At copper plants worldwide, the sustainable use of industrial waste is the new mantra as companies increasingly seek to protect our natural environment, while simultaneously driving innovation and not compromising on our quality of life. Copper slag, for instance, is gainfully used by many industries.

At Sterlite Copper, 100% of the copper slag generated from operations is used for various beneficial applications like construction, road laying, landfills, sandblasting and in the cement industry. This sustainable use of industrial waste protects the environment by minimizing the usage of natural resources such as river sand.





FLUE GAS DESULPHURISATION SYSTEM (FGDS) SCRUBBER WITH BAG FILTER IN PRIMARY SMELTER

FGDS comprises a bag filter with dry lime injection system for dust removal followed by two stage scrubber for sulphur-di-oxide removal followed by a caustic lye polishing system. The scrubbed gases are vented through the existing stack arrangement. As the dust in the gases is removed before entering the scrubber, the output generated from the scrubbers is relatively free from metals, thus enabling the Effluent Treatment Plant (ETP) to produce better quality gypsum.

Cost of project: INR 4500 Lacs

Benefits: Enhanced scrubbing system and production of clean gypsum.



CONVERTER BAGHOUSE IN SECONDARY SMELTER

The secondary gases collected from the convertor furnace operations is passed through the modules of the baghouse to filter dust from the gas stream. The clear gas is sent to scrubbers for necessary lime scrubbing.

Cost of project: INR 3500 Lacs

Benefits: Helps produce clean gypsum.



SULPHURIC ACID PLANT CONVERTER MODIFICATION FOR BETTER EFFICIENCY

To further improve the conversion process efficiency of Sterlite Copper's Sulphuric Acid Plant (SAP) at par with global smelters, from 99.6% to 99.99%, a new converter bed and a heat exchanger were installed in the existing converter bed of Sulphuric Acid Plant - 1.

Cost of project: INR 1665 Lacs

Benefits: SO₂ Emission rates reduced to less than 1Kg/Ton of acid produced and improved conversion rates of SO₂ to SO₃, which is at par with global emissions.



EFFICIENT WATER MANAGEMENT SYSTEMS

The Effluent Treatment Plant is upgraded to handle the effluents using Sodium Sulphide Process in order to reduce hazardous waste generation. This would also help segregate clean gypsum for sale, helping create value from waste. The company has also installed a Reverse Osmosis plant for tertiary treatment of effluents. The treated water thus generated is reused in the operations.

Cost of Project: ETP upgrade: INR 91 Lacs

RO Plant: INR 7500 Lacs

Benefits: Improved Automation for efficient ETP process and optimization / reduction of hazardous waste, reduced intake of raw water and efficient reuse of water.

GYPSUM PIPE CONVEYOR

Gypsum, a by-product from the phosphoric acid manufacturing operations is laden with 20-22% moisture at the time of production. The gypsum generated is transported in the tube conveyor from the point of generation to the intermediate storage in gypsum pond. This closed tube conveyor operations has significantly eliminated dust emissions arising from spillage of gypsum. It has also eliminated the need to transport gypsum via trucks thereby greatly reducing traffic inside the plant.

Cost of project: INR 250 Lacs

Benefits: Significantly reduced dust emission, zero resource loss, zero spillage, enhanced safety.

CONVERSION FROM WATER COOLED SYSTEM TO AIR COOLED SYSTEM FOR ACID COOLING IN SULPHURIC ACID PLANT (SAP)

The conventional water cooling system for reducing the temperature of the Sulphuric Acid has been replaced with air cooled condensers. In this process, large diameter fans are used to pull the atmospheric air to cool the hot water circulated in the tubes. Air cooled condensers is a closed loop operation that eliminates the evaporation of water..

Cost of project: INR 434 Lacs

Benefits: Reduced consumption of raw water by 60%.

WASTE HEAT RECOVERY BOILER IN THE ISA SMELTER

The 5 MW electricity generation project from the Waste Heat Recovery Boiler in Sterlite Copper's ISA Smelter has been identified as a Clean Development Mechanism (CDM) project under the Kyoto Protocol. (The Kyoto Protocol is an international treaty which extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and commits state parties to reduce greenhouse gas emissions.) The gases coming from the smelter are laden with heat. The heat generated from these gases is utilized to produce the steam. This steam is then used in running the turbine and generator. The estimated annual carbon credit generated from this project is about 27000 tonnes.

Cost of project: INR 3500 Lacs

Benefits: Generates 5 MW electricity from Waste Heat Recovery Boiler in the ISA Smelter.



Copper is the third most used metal in industrial and civil applications, and its demand increases the need for its production, consequently generating job growth and providing significant contributions to local economies and the nation overall.

Sterlite provides direct employment to 4000 people and impacts more than 20,000 people engaged in various supplier and customer units.

LET'S DISCOVER THE SHINE BENEATH.



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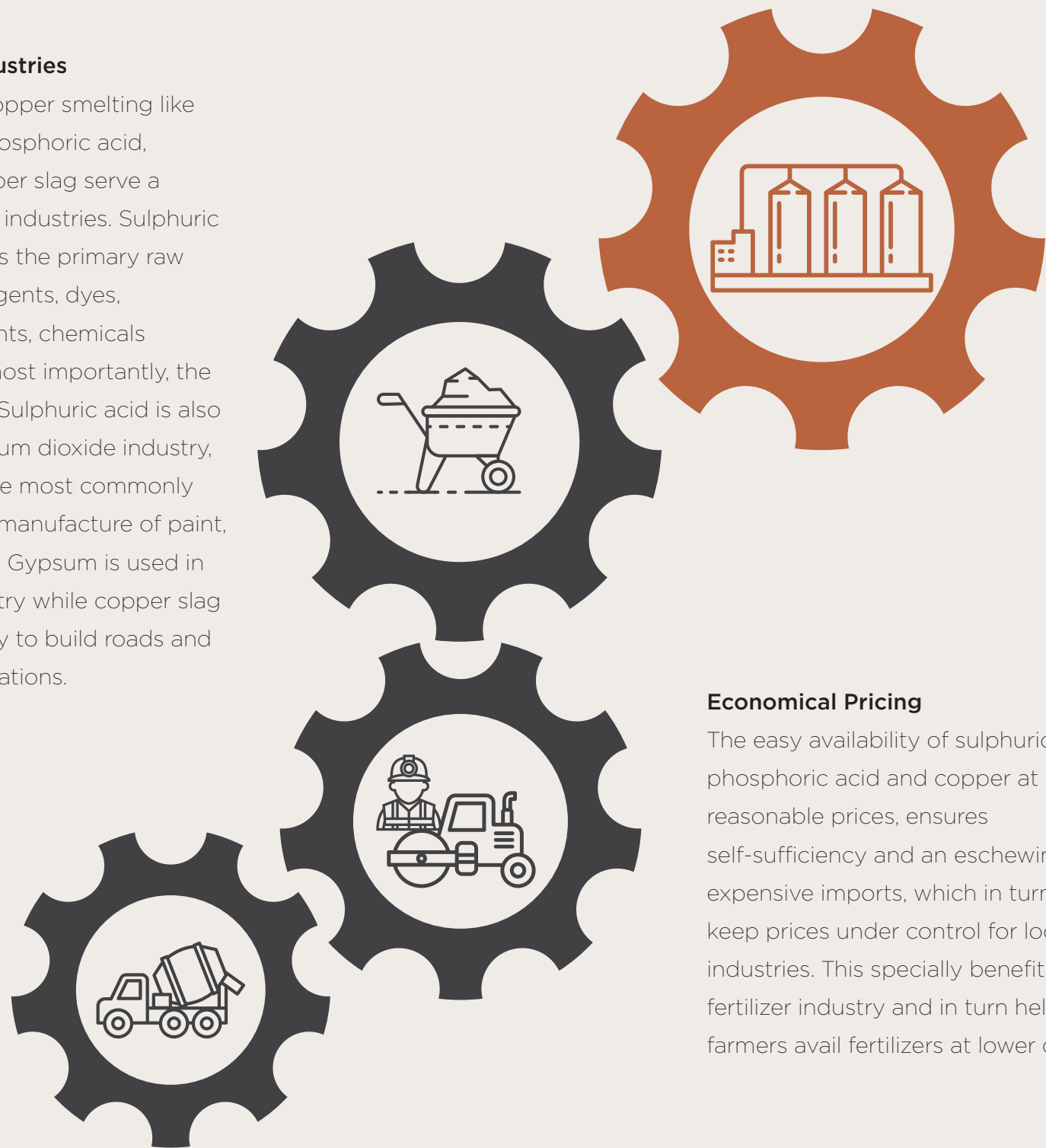
**Every copper plant opened around the world,
has also opened up an entire world of possibilities
for mankind.**

What began as a romance with ornaments, developed into a lifelong association over the centuries. Early copper artifacts, first decorative, then utilitarian, were hammered out from native copper. Today copper plants around the world support a host of critical industries improving the quality of human life. Let's take a look at the positive impact, a copper plant has on its partner communities.

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Downstream Industries

By-products of copper smelting like sulphuric acid, phosphoric acid, gypsum and copper slag serve a number of critical industries. Sulphuric acid for instance is the primary raw material for detergents, dyes, chemicals, pigments, chemicals production and most importantly, the fertilizer industry. Sulphuric acid is also used by the titanium dioxide industry, which in turn is the most commonly used input in the manufacture of paint, rubber and paper. Gypsum is used in the cement industry while copper slag is used extensively to build roads and for cement applications.

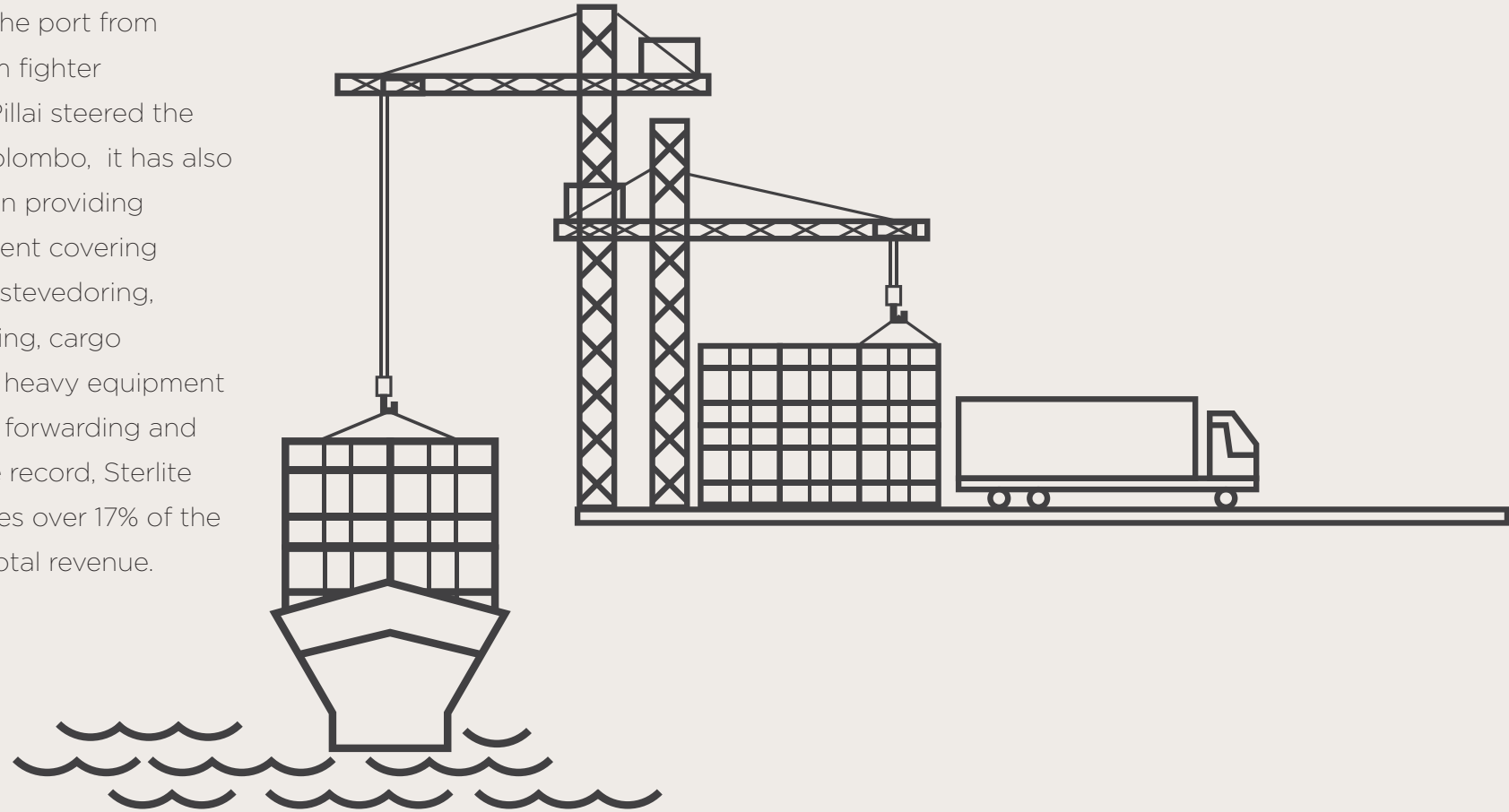


Economical Pricing

The easy availability of sulphuric acid, phosphoric acid and copper at reasonable prices, ensures self-sufficiency and an eschewing of expensive imports, which in turn helps keep prices under control for local industries. This specially benefits the fertilizer industry and in turn helps farmers avail fertilizers at lower costs.

Ports and Transportation

The sheer scale of operations of a copper plant can play an indispensable role in providing cargo traffic to a port and utilization of its berth capacity. A case in instance is the VOC port of Thoothukudi. While it has the distinction of being the port from where noted freedom fighter V. O. Chidambaram Pillai steered the first Indian ship to Colombo, it has also bloomed in the region providing large-scale employment covering chartering, shipping, stevedoring, clearing and forwarding, cargo handling, packaging, heavy equipment handling, freight and forwarding and warehousing. For the record, Sterlite Copper alone provides over 17% of the Thoothukudi port's total revenue.



Employment Advantage

Setting up a copper plant is one part of the story. Running it, needs people, naturally. And be it direct or indirect employment, the scope for providing livelihood to people in and around a plant is always enormous. Not just through direct employment at the plant premises, but by an entire network of jobs that gets created through the setting up of ancillary and downstream industries.

Advantage to Thoothukudi People

Business has a responsibility beyond its basic responsibility to shareholders; a responsibility to a broader constituency that includes the people of the communities in which it operates. This means providing facilities like education, better healthcare and drinking water. In short a responsibility to provide better life to people, especially those marginalized in society.





While most industries can affect the environment, in many instances extensive environmental regulation related to air and water quality, materials handling and disposal practices can and has mitigated the impact.

While Sterlite complies with global environmental regulations, it also has a fully - equipped Occupational Health Centre for pre-employment/periodical/ pre-placement/exit medical examination for all its employees, besides a mobile healthcare van that provides primary health services to all the villages located near the plant.



PYRAMIDS AT ABUSIR, NORTHERN EGYPT

In 1994, archeologists excavating the remains of a 4,500-year-old Egyptian pyramid complex unearthed a sophisticated copper drainage system, completely intact. Experts speculate that the copper pipes were used to drain well water that was carried into the temple to bathe the king's statues.

INDUSTRY ACHIEVER OR NATIONAL CONTRIBUTOR



by the Customs Department



by the Customs Department



Sterlite Copper in the
CCI Best Export & Port user Award



Awarded for
contributions to Exchequer

SUSTAINABILITY & CSR



Silver Trophy, by ASSOCHAM and
Ministry of Skill Development & Entrepreneurship
(Project Tamira Muthukkal)



by British Safety Council



by CII-EHS



in the CII Southern Region
Environment,
Health & Safety (EHS)

ENERGY AND WATER CONSERVATION



Industrial Water Use Efficiency
at National Competition for
Excellence in Water Management
by FICCI



in the 17th national
Energy Management Award 2016
by CII GBC



CII Noteworthy Water
Efficient Unit Award
2016, 2017



CII Excellent Energy
Efficient Unit Award
2014 - 2017 (4 times)

HUMAN RESOURCES & EMPLOYEES



Awarded for excellence in
HR practices



in the HR club 7th
National Conference &
Game Changer Awards
held by The HR Club.



Best retention strategy
& innovation in
recruitment strategy



CII - Strong Commitment
to HR Excellence Award

INNOVATION, QUALITY & TECHNOLOGY



in QCFI (Quality Circle Forum of India)
CCQC (Chapter Convention for Quality Circles)
2017



Business Excellence Team



in National Convention
for Quality Circle- NCQC
Mysuru



Recognition for Quality

OPERATIONAL EXCELLENCE



Awarded for excellence in
operational processes



Frost & Sullivan 14th Edition of
India Manufacturing Excellence
Award (IMEA)



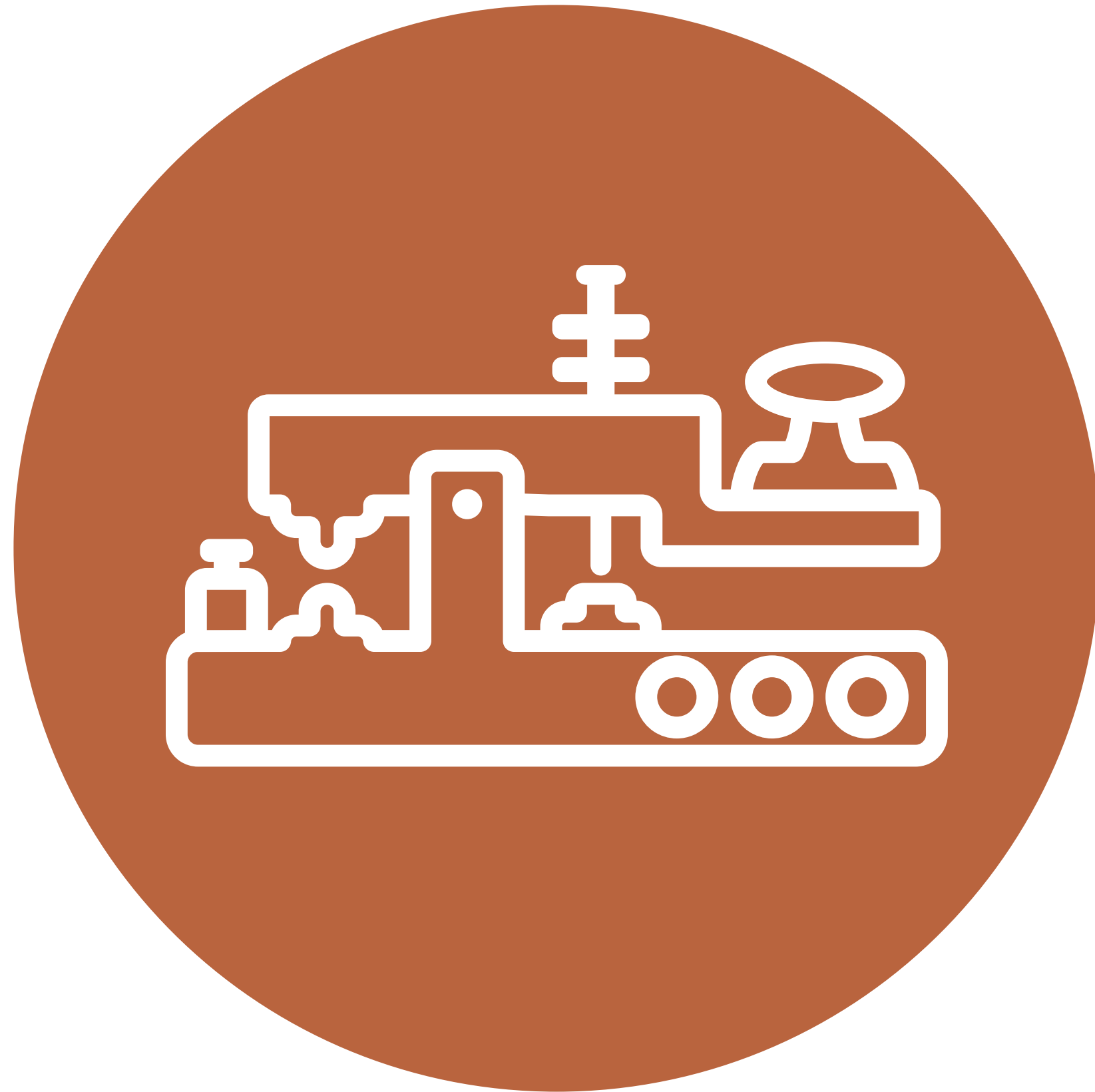
in INSAAN Award 2015



Heavy Engineering' Award
by Future Supply Chain
10th Express, Logistics & Supply chain
Leadership Award 2016
by Future Supply Chain.



In its efforts towards greening the environment, Sterlite has a green print too. 43 hectares have been developed as a greenbelt in and around the plant. This mitigate dust and noise levels.



In 1822 Oersted, a Danish physicist, held in his hands a piece of copper wire, joined to two poles of a Volta pile. And he suddenly saw the magnetized needle on his table move...a wire carrying an electric current deviates a magnetized needle from its position.

That was the birth of telegraph and modern communication.



Since 9000 BC, there have been numerous instances in my journey with man where I have served his requirements. From being crafted into tools, weapons and ornaments, to travelling with him to the moon, I have faithfully enabled the advancement of human civilization for several millennia. Today man relies on me for power, lighting, heating, communications, water supply and transport. I have helped make homes, hospitals, schools and offices comfortable and efficient, generated clean and renewable energy, and transmitted energy with high efficiency and minimum environmental impact.

At Sterlite too, the journey has been quite momentous. In serving the defence, automobiles, consumer durables, electrical and construction industries, I have been a vital element of India's economic landscape.

It has often been said that, a country's advancement is measured by the per capita consumption of copper. And it is true the world over including Asian countries like China and India. For India in particular, to become a superpower, copper has to be manufactured in-house. And in this mission, copper manufacturing industries have a meaningful role to play.

Throughout the ages, man has relied on copper for development. Copper has been part of the march of history. Nothing has changed today. As technology advances, the demand for copper will only continue to rise. Indeed, the epithet 'red gold' that copper earned in ancient times is just as relevant even today because copper is just as precious even today.

THANK
YOU

for being part of my journey.